

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
26 February 2004 (26.02.2004)

PCT

(10) International Publication Number
WO 2004/017372 A3

(51) International Patent Classification⁷: **H05K 9/00**,
7/20, 9/00, 1/00

(21) International Application Number:
PCT/US2003/025461

(22) International Filing Date: 14 August 2003 (14.08.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/403,302 14 August 2002 (14.08.2002) US

(71) Applicant (for all designated States except US): **HONEYWELL INTERNATIONAL, INC.** [US/US]; a Corporation of the State of Delaware, Law Department AB2, P.O. Box 2245, Morristown, NJ 07962-9806 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **RICHEY, Manuel**,

F. [US/US]; 29005 Orchard Road, Paola, KS 66071 (US).
REIM, Terry, Kenneth [US/US]; 206 West Nichols,
Spring Hill, KS 66083 (US).

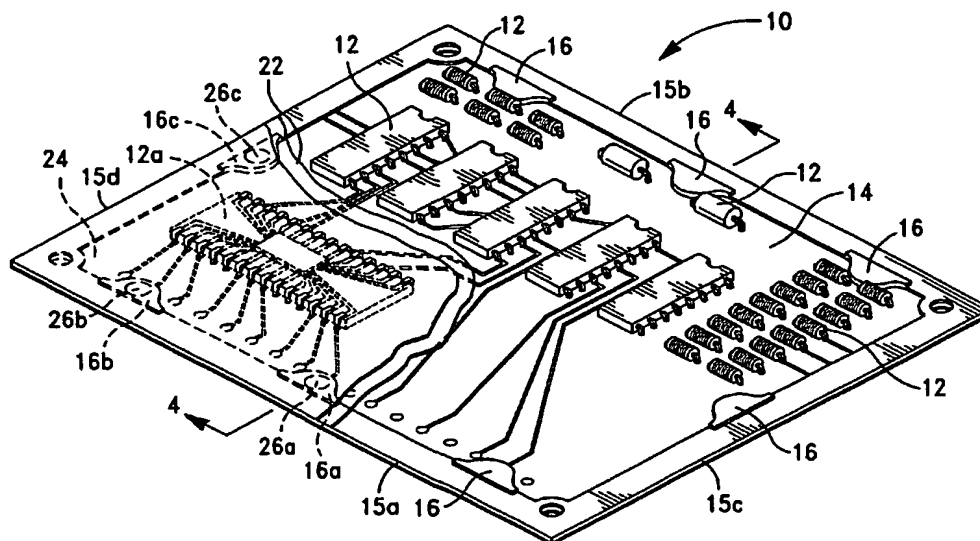
(74) Agents: **CARLSON, Judith, L.** et al.; Honeywell International, Inc., Law Department AB2, P. O. Box 2245, Morristown, NJ 07962-9806 (US).

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: METHOD AND APPARATUS FOR REDUCING ELECTROMAGNETIC EMISSIONS FROM ELECTRONIC CIRCUITS



(57) Abstract: An electronic circuit (10) comprising at least one electrical component (12) and at least one grounding point (16) is provided that includes a first layer of non-conductive coating (18) and a second layer of conductive coating (20). The non-conductive coating (18) is applied over the electrical component (12) in such a manner that the grounding point (16) remains uncoated. The conductive coating (20) is applied over the non-conductive coating (18) and the grounding point (16) so as to ground the conductive coating (20). The conductive coating (20) thus shields the electrical component (12) to thereby reduce electromagnetic emissions from the electronic circuit (10). Various exemplary embodiments of the coated electronic circuit and associated method are provided.



Declaration under Rule 4.17:

— *of inventorship (Rule 4.17(iv)) for US only*

Published:

— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(88) Date of publication of the international search report:

1 July 2004

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/25461

A. CLASSIFICATION OF SUBJECT MATTER																				
IPC(7) : H05K 9/00; H05K 7/20, 9/00; H05K 1/00																				
US CL : 361/816, 818, 800; 257/655, 660; 174/35R, 35MS, 260																				
According to International Patent Classification (IPC) or to both national classification and IPC																				
B. FIELDS SEARCHED																				
Minimum documentation searched (classification system followed by classification symbols) U.S. : 361/816, 818, 800; 257/655, 660; 174/35R, 35MS, 260																				
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched none																				
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) none																				
C. DOCUMENTS CONSIDERED TO BE RELEVANT																				
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.																		
Y	US 5,166,864 A (CHITWOOD et al.) 24 November 1992 (24.11.1992), see entire document.	1-11																		
Y	US 5,557,064 A (ISERN-FLECHA et al.) 17 September 1996 (17.09.1996), see entire document.	1-11																		
Y	US 5,639,989 A (HIGGINS, III) 17 June 1997 (17.06.1997), see entire document.	1-11																		
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.																				
<table border="0"> <tr> <td colspan="2">* Special categories of cited documents:</td> <td>"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</td> </tr> <tr> <td>"A" document defining the general state of the art which is not considered to be of particular relevance</td> <td>"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</td> <td></td> </tr> <tr> <td>"E" earlier application or patent published on or after the international filing date</td> <td>"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art</td> <td></td> </tr> <tr> <td>"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</td> <td>"&" document member of the same patent family</td> <td></td> </tr> <tr> <td>"O" document referring to an oral disclosure, use, exhibition or other means</td> <td></td> <td></td> </tr> <tr> <td>"P" document published prior to the international filing date but later than the priority date claimed</td> <td></td> <td></td> </tr> </table>			* Special categories of cited documents:		"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention	"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone		"E" earlier application or patent published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art		"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family		"O" document referring to an oral disclosure, use, exhibition or other means			"P" document published prior to the international filing date but later than the priority date claimed		
* Special categories of cited documents:		"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention																		
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone																			
"E" earlier application or patent published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art																			
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family																			
"O" document referring to an oral disclosure, use, exhibition or other means																				
"P" document published prior to the international filing date but later than the priority date claimed																				
Date of the actual completion of the international search 21 January 2004 (21.01.2004)		Date of mailing of the international search report 04 MAY 2004																		
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (703) 305-3230		Authorized officer <i>Nora McChapman</i> David S Martin Telephone No. (703) 308-3121																		